LISTINGS NEWSLETTER

Newsletter of the
Long Island Sinclair/Timex
Users Group

Issue: NOVEMBER 1996

Please send all inquiries and submissions (including dues) to: L.I.S.T.
Mr. Harvey Rait
5 Peri Lane,
Valley Stream, N. Y. 11581

COMING EVENTS: The next L.I.S.T. meeting will be Sunday, 12/15/96 at 2 P.M. at the home of Harvey Rait (see address above).

Listing Policy

Annual Dues $16.00

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RAIT'S RAMBLINGS

Once again I give myself the opportunity to ramble on about any subject that may enter my famished mind. This is not famished as in hungry but the Yiddish version meaning mixed up. I had planned to write this column earlier in the week but as luck would have it I came down with a bad cold including fever that rendered me incapable of even stringing two thoughts together. If body temperature was equivalent to the stock market I would have sold last night at 102 and made a 4 point profit.

Last week I recieved a cal from a gentleman that was working at the Cold Spring Harbor laboratory. PhilippeVielle was calling on behalf of his cousin in Mexico that had heard of LIST and wanted more information. I sent him my copy of the September LISTings newsletter and hopefuly I will hear from his cousin in Mexico and perhaps have a new member. It's really amazing how many people are still dabbling in the world of Sinclair/Timex all across the globe. We don't have the funds to publicize our existence as much as we should but considering our basic efforts I think we are not doing too badly. Since our newsleter is produced by Bob Gilder,he has made a deal with me that I only have to give him a disk of what I write and he formats and prints the page on one of his many printers. Keeping that in mind, I'm going to segue into a feature article that will fill up the rest of this page"s column and continue on the next page.

This feature is credited to Lou Dolinar of Newsday. PRINTER EVOLUTION-A QUIET REVOLUTION.

A lot of different things have to work together to successfully print those typeset looking pages that routinely roll out of your computer bundle's ink jet printer. Indeed, the progress in printers has, in a lot of ways, been more impressive than the improvements in computers overall. It is a technological miracle that's been widely available for only about three years. yet we increasingly take it for granted. We shouldn't. Why? Though the Internet grabs most of the media ink, desktop publishing-b driving down the cost of typesetting-has had a far greater impact on society. Small circulation newsletters that would have never been economical to publishnow are,thanks to PC-based typesetting. Weekly newspapers, in competition with large dailies, got a big shot in the arm. It seems that every volunteer organization from your kids soccer league to your church to your local volunteer fire department is now routinely publishing proffessional looking documents to keep members informed.

How about you? You may never publish a Web page, but you'll use your printer every day. If you can visualize it, you can print it. The quality? Potentially, about as good as your commercial newspaper's front page. But ,not quite up to the National Geographic standards yet.

A little background is in order here, even if you're planning only to print greeting cards. For starters, keep in mind that the appearance of computer screens, and the way in which documents are printed, is a relatively new phenomenon, a product of much faster hardware and contemporary computer operating systems. Up until about 10 years ago, you had to buy a specialized typesetting system that could cost in the tens of thousands of dollars. Serious systems could have run into the millions.

Personal computers, meanwhile, displayed fixed-pitch characters, embedded directly into the computer's hardware, usually in a matrix of 80 characters across the screen by 25 lines down. Thee appearance of the characters was not easily changed, saving the computer a lot of work. Pressing the "A" key told the computer in effect to "get the character 'A' " and put it on the screen next to the cursor. Printers, meanwhile, had only physical typefaces in metal or plastic. Therefore you might get a typewriter style font plus a bold and an italic version of the same type.

Formatting a document, meanwhile was a huge hassle, because what appeared on the screen bore almost no resemblance to what was printed out. Computers for this application were no more than just fancy electric typewriters. Even early dot-matrix and laser printers followed the fixed-font model.

Let me slide in an historical note here. Dot-matrix printers are sometimes referred to as line printers because they process pages one line at a time, which is why the parallel printer port in the back of some computers is sometimes called LPT1 for "line printer 1". They are also called impact printers, because they bang on the page. Laser printers are referred to as "page printers" because they image the entire page at once. Not of any matter because you would still plug it into LPT 1, since there is no such port designated as PPT1. WYSIWYG (what you see is what you got) pronounced whizzy-wig by the geeks, first became available on the Mac about 10 years ago and was a huge step forward. Both the screen and the printer became completely "soft", meaning that that you could add new typefaces and sizes merely by installing more font software. Today you can buy hundreds of fonts on CD for next to nothing. Soft fonts put a large computational burden on the computer and on the printer, since they had to in effect draw every character dot by dot. While this suddenly gave you tremendous flexability, it also slowed everything down since the two types of printers that were available at the time, dot matrix and lasers also had to draw the printed characters.

But the biggest problem associated with printing WYSIWYG 10 years ago remained the cost. (One of the reasons that Mac never became the dominant mass market computer.) Dot-matrix printers were cheap, not much more than a decent ink jet today, but the quality was abysmal. Laser printers had great looking output, but at $5,000 or more, were too expensive for most home users. The result was that although it had become far less expensive than professional type shops, desktop publication was still a business application.

Starting about 1991, ink jet printers changed all that. Arriving at about the same time as Windows 3.1, they helped insure its success. As with dot matrix printers, they manipulated and printed one line at a time, and thus were as cheap to build as dot matrix printers-and maybe cheaper since they did not have to stand up to the stress of pounding away at a platen. The quality was almost as good as a laser's, which has always been a litttle more expensive because it has to work with a full page of data at a time. Unlike laser printers the original black-and-white jet designs were easily modified to print-drum roll please- ta da - color. About the only reason you would use a dot matrix printer today is to fill in pre-printed multilayer carbon forms. For people who do a lot of printing of black-and-white documents, lasers still reign because they cost as little as a third as much per printed page as ink jet systems. More expensive models are also capable of higher print rates and higher resolutions than ink jets.

With those exceptions, ink jets are where the action is today for home users. The main thing to watch for, assuming that you're not already stuck with a bundled printer, is whether you are getting a true black printer. AS mentioned earlier, some color printers are really retooled black-and-white models. In these, if you want to print black, you snap in a black print cartridge; for color you remove that cartridge and and add a color one. If you try to print text and graphics together, blacks are produced by combining colors, which usually results in an ugly greenish tinge to your type. Better printers allow you to use black and color cartridges simultaneously. The result is fewer hassles with changing cartridges and better quality output.

How much resolution do you need? You have to be the judge, but keep in mind that less resolution generally equals faster print speed and less consumption of consumables. If you are printing black text, the difference between 300x300 dpi (dots per inch) and 600x600 dpi isnt that visible to most people. On the other hand, if you're printing photos, the extra dots allow for more and far more accurate shades of gray. If you're planning to take your output to a proffessional printer to have it turned into a plate for mass printing, 600x600 is probably the minimum that you'll need.

Harvey Rait

ATTENTION LIST Subscribers: When it is time to renew your membership, (look at your mailing label), please make out your check to Harvey Rait, LIST President or to Robert Malloy, Treasurer. PLEASE DO NOT MAKE OUT YOUR CHECK to LIST. Our bank requires a large amount of money in a savings account in order to cash checks. THANK YOU!

Harvey Rait
5 Peri Lane,
Valley Stream, NY 11581

Robert Malloy
412 Pacific Street,
Massapequa Park, NY 11762

Due to rising postage costs outside of the United States, we must raise our annual dues accordingly:

CANADA and MEXICO $17.50 US, and the rest of the world $24.00 US.

Bob Malloy, LIST Treasurer

QL CORNER

CHECKBOOK

Checkbook is an Archive program which can keep track of checks, deposits, help keep a balance, and use a printer to print out a check. It contains two files. One for checks (CHECKWRITE_DBF) and one for deposits (DEPOSITS_DBF). Typing use "c" will make the checks file current and typing use "d" will make the deposit file current.

Fields

The checks file(CHECKWRITE) has six fields, most of which are fairly obvious (I hope). Note that the AMT field is for numeric entry and the AMOUNT field is for text entry. The FOR field is optional. The CLRD field shows only with DISPLAY and

is used to indicate that the check has been cleared by the bank. Placing any character(s) (other then space) will tell the program that the check has been cleared. his is necessary in order for the Procedure STATEBAL to work.

The deposits file (DEPOSITS) has four fields. Again, fairly obvious (I hope). The DEPCLRD field has the same purpose as the CLRD field.

MENU

Menu is not really a menu but rather a procedure which will give a listing of procedures you can use.

HOW TO USE CHECKBOOK

1. With Archive loaded, put checkbook disc in drive 2, type RUN, press Enter and then type CHECKBOOK. When loading is finished you can type either DISPLAY or SCREEN. Display will work with both Checks and Deposits, Screen will only work with Checks (logical c)

2. To enter checks use Insert and enter data.

3. With check details on screen and check in printer, type PRINTCHECK and press Enter.

Notes:

4. RUN "CHECKBOOK" will open the files and load the screen and checkwriting program. Don't forget to CLOSE both files when you are done. (Typing QUIT will automatically close all open files.) If you just want to look at the files then use Look "CHECKWRITE" or Look "DEPOSITS.

5. HOW TO PRINT A CHECK.

My printer is Epson compatible. I load a check in from the top, with the left end at the 0 mark. I then roll the check in so that 3/8 inch of the bottom remains out. You can test the printing by cutting pieces of paper the size of checks or, if your bank returns cancelled checks, by printing over a cancelled check.

5a. FOR

The FOR box on checks is so low that when the check is rolled to that position for printing my printer gives an out of paper signal. To solve this the program checks to see if you have written anything in the FOR box. If you have it will stop printing and tell you to "Insert paper, then press any key". The idea here is by inserting a sheet of paper behind the roller the out of paper signal will be avoided.

6. Your Name

To have your name appear on screen in the signature location type SEDIT and press Enter. You can then replace my name with yours. Dont forget to ssave TESTCHECK.

Bob Malloy

Editor's note: If you are interested in using the Checkbook program, send a formatted DD diskette with return postage to Bob Malloy, 412 Pacific Street, Massapequa Park, NY 11762.

Prime Electronic Components of Long Island are advertising a NEW ALPS, 3.5" floppy disk drive for 755 series Thinkpad Laptop. This drive will be able to read/write to 720K, 1.44M and 2.88 M (3.2M on the QL). The drive sells for $59.95 each.

For quite some years, I have been searching for an 6 inch unfiltered UV Black lamp for an eprom eraser, capabile of erasing at least six eproms at one time. Electronic Goldmine has a kit with an unfiltered UV 6 inch lamp and a power supply using a 9 volt battery for $16.00 plus $5.00 shipping. I will report on the success or failure of this project.

This company has lots of electronic goodies, clean surplus and hard to find electronic items. Send for their free 62 page catalog. The Electronic Goldmine, P. O. Box 5408, Scottsdale, AZ 85261; Telephone: 800-445-0696; FAX: 602-451-9495.

I have recently purchased a QXL manufactured by Miracle Systems as a backup in the event my QL's go to never, never land. I have not yet purchased an IBM computer, however, I plan on purchasing a brand-new 486 DX-33 baby motherboard from Halted Specialtes Company at $27.00. Stock number HSC#16152. The mother board has 5 sixteen-bit sockets and two 8-bit sockets, 8 30 pin SIMM memory sockets, includes 256 cache, AMI BIOS installed and manual. Ninety days warranty. NO CPU.

Halted Specialtes Co., 3500 Ryder Street, Santa Clara, CA 95051, toll free orders (1-800-4 HALTED. They are reliable!

B. G. Micro has 486SX-2 66 MHZ CPU chips at $17.50 or two for $30.00. B. G. Micro, P. O. Box 280298, Dallas, TX 75228. 1-800-276-2206. All of their surplus items are clean and they are reliable.

WANTED

I would like to purchase a Keyboard 90, keyboard interface in good working condition. Please telephone or write to:

Bob Gilder, 69 Jefferson Place, Massapequa, NY 11758

Telephone 516-541-2271

See you next month... ***Bob Gilder***

BANKSWITCHED RAM ON THE TS2068 AND SPECTRUM by Alvin R Albrecht
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[Posted in COMP.SYS.SINCLAIR on 1996 October 27 as part of his project for RAM bankswitching. Albrecht is at albrecht@freenet.calgary.ab.ca. Some spot editing by John Pazmino.]

The project that generated the most interest on the group seems to be the 1MB bankswitched memory project for the ts2068/Spectrum. I haven't had time to complete this project on my own, so I'm submitting it here as a "work in progress". Everyone is welcome to offer contributions, suggestions for changes, etc. Not all the design decisions have been made yet, so there may have to be changes made to the circuit as we go along.

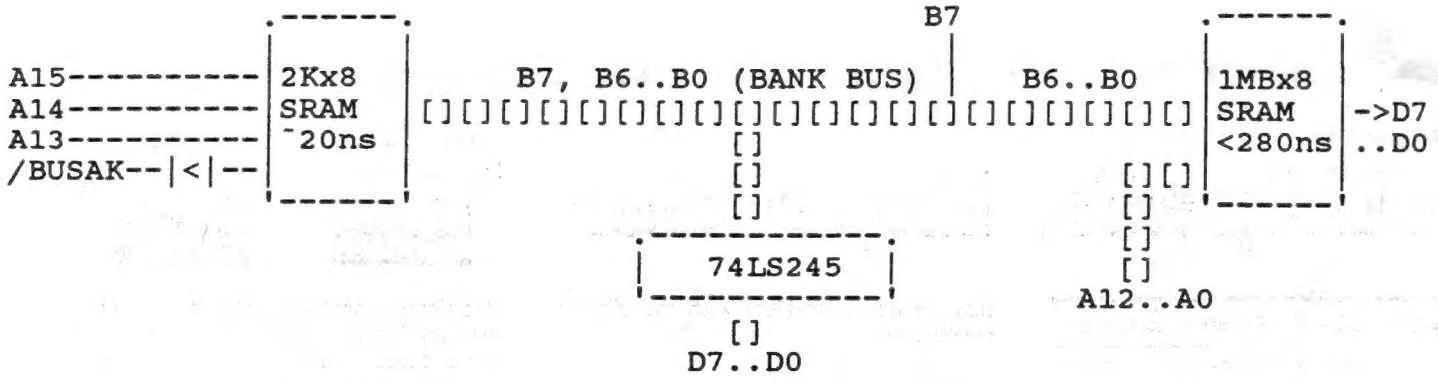
The software I'll be using to do pcb layout is shareware and can be found at http://www.abcircuits.com/ It generates a Gerber file for foil pattern and a drill file. These guys will also make double sided boards within 48hrs at a cost of 0.85*A+60/n Canadian dollars per board (A=area of one board in in^2, n=how many boards which must be even and at least 2). This project will likely fit on a board no bigger than 25in^2, so if 8 boards were made, they would cost C$28.75 each (US$21.56, BP14.38). If I made them myself, they'd cost $10 + three hours of work and they'd be a whole lot crappier. In conclusion, they're quite economical.

There are going to be some departures in the design for our Spectrum friends as the ts2068 was designed with bankswitching in mind and has the signal "/be" available on the rear edge connector. When pulled low, this signal causes all internal memory to be disabled. The Spectrum has no analog really, except for /roscs which will disable memory in the 0-16K area (the ROM). The only machine which may have such a signal is the +3 which is capable of remapping its entire 64K of memory in 16K blocks. I'm not too familiar with the hardware of the Spectrums, so someone else is going to have to provide a way to disable all memory internal to Spectrums in order for this project to work.

The Z80 has a 16 bit address bus. As such only 2^16=65536=64K of unique memory addresses can be generated and the Z80 can never see more than 64K of memory at once. The trick behind expanding the amount of memory for a Z80 is to have a large pool of memory, of which the Z80 can only see 64K at a time.

I've followed Timex's lead and have divided the Z80's address space into eight 8K chunks: chunk0=0-8K, chunk1=8K-16K, ..., chunk7=56K-64K. Given a memory address, the most significant 3 bits will tell you what chunk it is in. Eg: address 43567=#AA2F=1010 1010 0010 1111. The top 3 bits are "101"=5. Therefore 43567 is in chunk #5. You can think of the Z80's 16 bit address as a 3 bit chunk # + a 13 bit address. These 8K chunks will be the minimum unit size of any bankswitched memory. We could alter the size of the chunks by using more or less bits in the address to specify chunk#, but I think 8K chunks are probably about the right size for a Z80 system.

The idea is this. When the Z80 wants to read or write to memory, the bankswitching hardware finds the chunk# of the requested address and determines what 8K segment of bankswitched memory is activated there. If no bankswitched segment is active, nothing else is done. However, if there is an active bankswitched segment, the signal /be is pulled low to deactivate all internal memory and the corresponding active segment is selected. This behaviour can be accomplished with the following three ICs:



Missing: Glue/Control logic. This will be housed in a GAL chip. In a previous version, I used a GAL20V8A.

The top 3 bits of the 16 bit address presented by the Z80 are fed into the 2kX8 SRAM (this is the smallest fast SRAM I found off the shelf. We really only need four address pins of the 11 available). Ignore the /BUSAK connection for now. On a normal memory access, the pin will be held high by the zero current flow through the diode (/BUSAK is always high unless a DMA operation is in progress).

The 2Kx8 SRAM spits out a segment # on B7..B0. IE- it gives a number identifying the memory segment that is occupying the corresponding 8K chunk. Since the output from the SRAM is 8 bits wide, there are 256 possible segment identifiers. This means we can have a memory pool made up of 256x8K=2MB of RAM. But, I decided to steal one bit, B7, to indicate whether we want the segment to behave as RAM or ROM. This bit will be interpretted by the control logic which, based on this bit and /rd and /wr, will decide whether to enable memory. This leaves us with a 7 bit segment number which can make use of a 1MB pool of memory.

[This is part 1; Albrecht plans further posts to continue the project.]

PLANET SINCLAIR NOW OPEN! by Chris Owen

[Posted in COMP.SYS.SINCLAIR on 1996 October 26; some spot editing by John Pazmino. Mr Owen is at co@romeo-klive.nvg.unit.no, in Norway.]

Well, it's taken a lot of work (and it's not yet 100% completed), but I've decided that I might as well open Planet Sinclair - the new NVG web site - for business. There are still some broken URLs but I'll fix the last of those next week, and put in the few remaining pages that still need to be done.

The URL's pretty much the same as before, so you don't need to change your bookmarks -

http://www.nvg.unit.no/sinclair/index.html

although you may want to bookmark the Planet Sinclair home page, rather than this transition page. It's best viewed with at least Netscape 2.0, or MS Internet Explorer.

The site has scores of new pages and new pics, so it should satisfy the ravenous appetites Sinclair fraternity! :-)

Let me know what you think...

ZX81 RAMpack Expander

If you have a few ZX81 RAMpacks, you can put them to work.

By Alan Madill

IT WAS kind of a sad day when the Sinclair ZX 81/Timex 1000 personal computer hit its North American marketing demise. The world's cheapest computer had bit the dust, overpowered by more complex bits of hardware (ones that had real keyboards).

As the prices dropped, a lot of dedicated hardware hackers went out and bought more; who could resist the price? Now you've got three sitting around glaring at each other.

The price of the 16K RAMpack dropped along with everything else, in some cases becoming as cheap as a set of 4116 RAM chips. Let's put this extra money to work.

The Sinclair's memory decoding is somewhat rudimentary. If the A14 address line from the Z80 microprocessor is high, or at a logic 1, then the RAMpack is selected. If it's low, the ROM chip is selected. Thus echoes of the 0 to 8K ROM are repeated again from 8 to 16K and twice between 32 and 48K. Fortunately, Uncle Clive left us the means to turn this off via the $\overline{\text{ROMCS}}$' line. The echo of the RAMpack from 48 to 64K is used in a devious way to generate the screen display, making the area unavailable for anything but data storage. More on this later.

The ideal spot to fit the extra memory seemed to be between 32 and 48K, allowing basic programs to store large arrays by acting as an extension of the original 16K RAMpack.

In the 8000H to C000H (32 to 48K) area of memory the A14 line will be low and the A15 line will be high. We use this combination to select the added RAM by pulling its A14 line high, (we'll refer to this line as R2). At the same time, we have to deselect the ROM by pulling $\overline{\text{ROMCS}}$' high. In doing so, we have to make sure that we don't interfere with the display mechanism.

The Video Area

The Sinclair gets by with a minimum of hardware in order to generate the video signal. Its controller chip interprets any Op-code fetch from an area of memory above 8000H (i.e. bit A15 high and $\overline{\text{M1}}$ low) as being part of the display routine. It then grabs the byte, feeds the Z80 a NOOP (OOH), and uses the byte to look up the character pattern in ROM (See *The Explorer's Guide To The ZX#80 and Timex Sinclair 1000* by Mike Lord). You mess with this, and your computer goes into never-never land. Therefore, we had better allow the controller chip access to the echo of the display file by making it impossible to run a machine code from any address above 8000H.

Now, for the part that Mr. Spock loves, the logic. The new RAMpack will be selected when A14 is low, A15 is high, and when M1 is high or inactive. The expression for this is:

$$A15.\overline{A14}.\overline{\overline{M1}} \text{ or } A15.\overline{A14}.M1$$

(See Fig. 1)

To deactivate the ROM, we make sure that we pull the $\overline{\text{ROMCS}}$' line high when R2 (the previous expression) is high and $\overline{\text{MREQ}}$ is low. Since this is the only time that we want to interfere with the ROM, this signal is sent through a diode to prevent pulling the $\overline{\text{ROMCS}}$' line low at all other times, activating the ROM chip when it isn't needed (See Fig. 2). OK, beam us up, Scotty!

The original was wired up using a bus board made up of a double-ended 50-contact protoboard and a 50-contact edge card connector that the Sinclair board plugs into. Both of these items used to be available through Radio Shack, but may be hard to find now. A manufactured bus board would be ideal, but you could also use a wire wrap edge card connector and a regular protoboard. Stained glass shops sell a self-adhesive copper "pinstriping" that is ideal for making edge card fingers.

Wiring

The original RAMpack is wired through without interference. The lines needed are listed in Table 1. The second RAMpack uses two I.C.'s to activate its A14 line when needed. A schematic using a Hex inverter and a three input NAND-gate is shown as an example in Figure 3, though it would be easy to implement using almost anything that's kicking around the junk box. Make sure that you tie all unused inputs high and add a bypass capacitor between supply and ground to reduce noise problems.

Assuming that you've built it without burning your fingers and have checked the

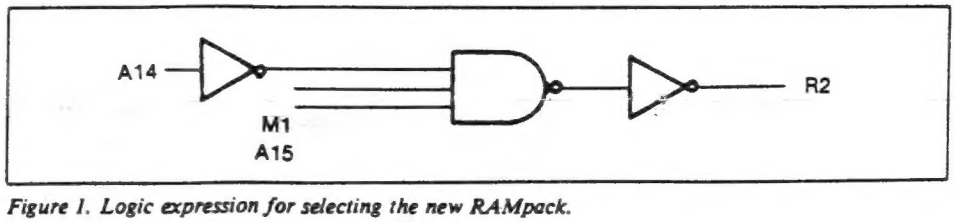


Figure 1. Logic expression for selecting the new RAMpack.

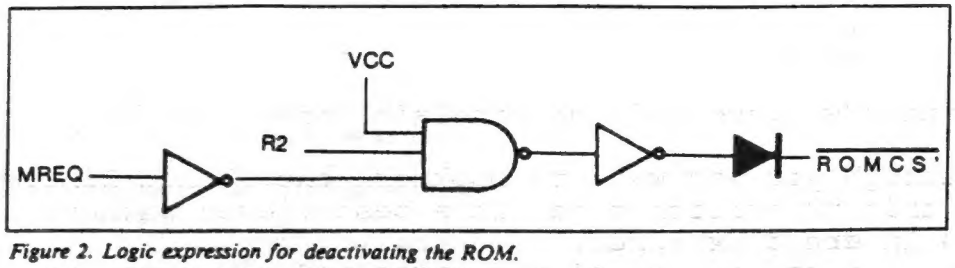


Figure 2. Logic expression for deactivating the ROM.

board over carefully for continuity and shorts, plug in the board by itself and power up the computer. You should get the almost instantaneous display typical of an un-expanded ZX-81. If not, power down immediately and check for things like loose connections, and I.C. or diode in backwards, or faulty components. Now try it with the first RAMpak. It should perform as usual. Power down again and add the second RAMpak. If the computer doesn't freak out, then you can start testing to see if the memory is actually there.

Tryout

Try a POKE 40000,123 followed by PRINT PEEK 40000. This should return the same value. Now set the system variable, RAMTOP, by setting its high order byte to point to the end of the new space with a POKE 16389,192 followed by NEW (this is an initialization sequence that has to be performed each time you power up). A PRINT PEEK 16389 should return 192 again. If it does, then the new memory is there and each location has been tested. If the value returned is 128, then the new RAMpack is not responding and it is time to check your wiring again. If you are using the old 650 ma power pack, then you may be over-loading the power supply.

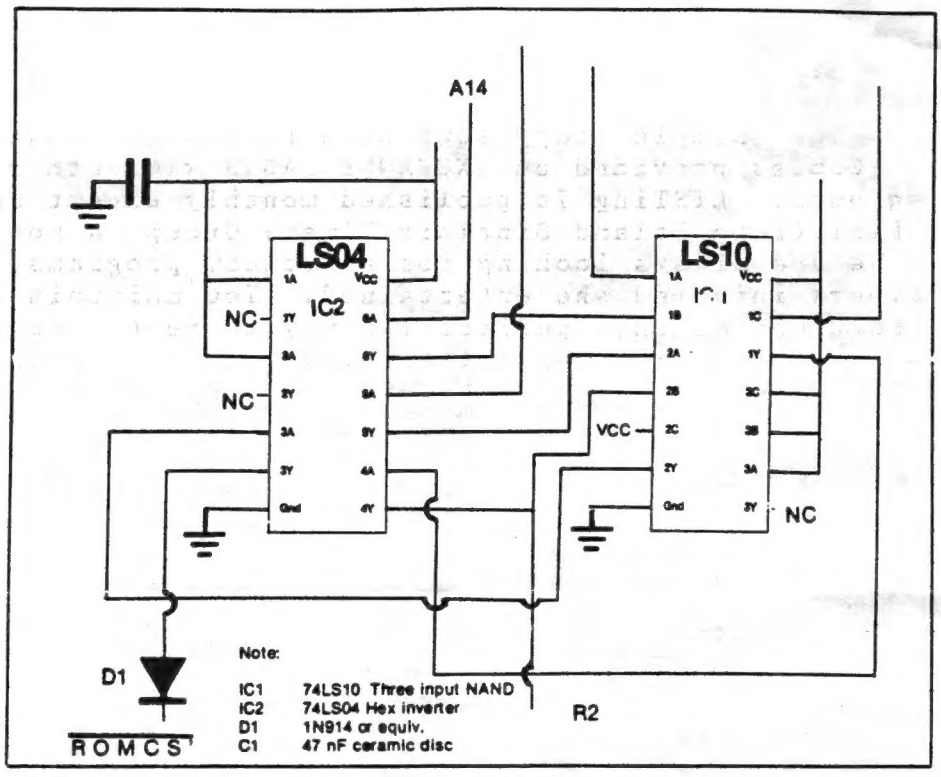


Figure 3. Circuit of the RAM selector using a three input NAND and a hex inverter.

TABLE 1

CARD CONNECTION		NAME	RAMPACK 1	RAMPACK 2
(Topside next to key)	T1	$\overline{D7}$	X	X
	T2	$\overline{RAMCS'}$	X	
	T3-T9	$\overline{D0-D6}$	X	X
	T13	$\overline{MREQ}$	X	X Decode
	T15	$\overline{RD}$	X	X
	T16	$\overline{WR}$	X	X
	T21	$\overline{M1}$		Decode
	T22	$\overline{RFSH}$	X	X
	B1	5V	X	X
	B2	9V	X	X
	B3-B4	0V	X	X
	B6-B9	A0-A3	X	X
	B10	A15	X Decode	OV
	B11	A14	X	Decode
	B12-B21	$\overline{A13-A4}$	X	X
	B22	$\overline{ROMCS'}$		Decode

It would be easy enough to add a third RAMpack in the COOOH to FF-FFH (48 to 64K) block of memory. This would require that we deselect the original RAMpack, when A14 and A15 are high, except when the display is active, i.e., when A15 is high and $\overline{M1}$ is low. The expressions for this are:

$\underline{16 - 32K}$ $\overline{R1}$ = $A14.\overline{R3}$ = $A14.\overline{A15} + A14.\overline{M1}$

$\underline{32 - 48K}$ $R2 = \overline{A14}.A15.M1$
$\overline{ROMCS'}$

$\underline{48 - 64K}$ $R3 = A14.A15.M1$

The uses for your expanded memory are almost unlimited. I've found that a cheque book managing program that used to have a capacity for 100 cheques now has the ability to store over 450 items. A memory management program could act a soft disk. More than one RAMpack could be mapped into the same block to allow paging between them. The only restrictions are your imagination and the capacity of your power supply. ■